PCAOB Monitoring and the Information Uncertainty Associated with Fair Value Estimates

Abstract

We study the role of the Public Company Accounting Oversight Board (PCAOB) as a monitor in mitigating uncertainty surrounding fair value estimates. Specifically, we examine whether the issuance of a PCAOB inspection report with fair value deficiencies (FV deficient inspection reports) is associated with a reduction of the information uncertainty associated with fair value estimates in clients' financial statements. We find a reduction in the information uncertainty (as proxied by implied asset-specific betas related to fair value disclosures) after the issuance of a FV deficient inspection report. This result is driven by a subsample of issuer clients that face greater exposure to fair value assets. In sensitivity analysis, we find evidence of greater audit effort (increased audit fees, and decreased transfers into level three fair value assets) and increased disclosure in the fair value footnote (increased number of words and number of asset/liability categories) after a FV deficient report, suggesting that auditors increase effort and scrutiny directed at fair value holdings. Our findings are incremental to the effects produced by SEC comment letters that discuss fair value issues. Overall, our evidence suggests that the PCAOB inspection process plays a role in mitigating opacity issues related to fair value.

Data Availability:

All data are publicly available as described in the text.

Keywords:

PCAOB inspections, fair value estimates, SFAS No. 157, information uncertainty

JEL Classification M41, M42, M48

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1 Introduction

Fair value estimates continue as a cause of concern for regulators, auditors and investors. While the number of audit deficiencies has decreased over time, as measured by Public Company Accounting Oversight Board (PCAOB or Board) inspection reports, the number of fair value estimate and impairment deficiencies has not (Glover, Taylor and Wuf 2017; Value Research Corporation (VRC) 2013). According to interviews and evidence gathered by Glover et al. (2017), professional auditors assert that the PCAOB expects what, in some cases, may not be deliverable: positive assurance that fair value estimates are not materially misstated. Based on the difficulties experienced by auditors and documented by fair value deficiencies in PCAOB inspection reports, financial statement users are left with little assurance that point estimates of fair value, which are sometimes based on subjective and unobservable inputs supplied by management, are reliable indicators to establish the valuation parameters of fair value assets. Hence, while high-quality disclosures contained in audited financial reports are meant to reduce information asymmetry and information risk in general, it is an empirical question whether the current audit standards or processes used to provide positive assurance for some complex fair value estimates result in high-quality disclosures given the inherent opacity surrounding these estimates.

This paper examines whether fair value deficiencies highlighted in PCAOB inspection reports serve as a monitoring mechanism to mitigate the information uncertainty associated with fair value estimates. If PCAOB-reported fair value deficiencies reveal weak links in the work of auditors, and auditors respond in kind with increased vigilance over the audit process of fair

value estimates for their issuer clients, then we would anticipate measures of information uncertainty associated with fair value estimates to be mitigated after the release of an inspection report.

In its auditing standards (PCAOB AS 2502), the PCAOB lists several factors that may lead to uncertainty in the reliability of fair value measurements.[1] Lambert, Leuz and Verrechia (2007) demonstrate that higher quality disclosures result in lower implied betas and cost of capital. Therefore, we predict that audit firms that receive PCAOB inspection reports with fair value deficiencies (hereafter "FV deficient inspection reports") will increase scrutiny and testing of their issuer clients' fair value estimates, which will increase disclosure quality and reduce information risk. In particular, we use the three-tier classification system prescribed by Statement of Financial Accounting Standards No. 157 (SFAS 157) to determine whether the implied betas of fair value assets classified as level 2 or level 3 decrease for issuer clients of audit firms that have received an inspection report containing a fair value deficiency.

Using a methodology developed by Riedl and Serafeim (2011), we measure asset-specific implied betas for level 1, level 2 and level 3 assets recorded in the client financial statements in the years following the issuance of a FV deficient inspection report. We find that the implied betas associated with level 2 and level 3 fair value estimates of financial assets are negatively associated with the issuance of a FV deficient inspection report. We also find that this result is driven by a subsample of issuer clients that face high exposure to level 2 and level 3 assets.

We conduct several sensitivity tests. First, we investigate changes in audit effort after the issuance of a FV deficient report. We find audit fees increase and net transfers into level 3

[1] These include "The length of the forecast period; The number of significant and complex assumptions associated with the process; A higher degree of subjectivity associated with the assumptions and factors used in the process; A higher degree of uncertainty associated with the future occurrence or outcome of events underlying the assumptions used; Lack of objective data when highly subjective factors are used." AS 2502 .24.

decrease after the issuance of a FV deficient report, suggesting increased audit effort in response to a deficient report.[2] Second, we hand collect fair value disclosures from the footnotes of annual reports to investigate changes in disclosure after the issuance of a FV deficient report. We find increased word count in the fair value footnote and increased segregation of categories of fair value assets and liabilities, suggesting enhanced disclosure in response to a FV deficient report. Third, we demonstrate that our findings are incremental to those documented by Bens, Cheng and Neamtiu (2016) who find evidence consistent with a reduction in information asymmetry after the issuance of a SEC comment letter related to fair value. Fourth, to mitigate concerns that our results are due to an omitted variable that is correlated to the issuance of a PCAOB inspection report, we examine the market response to the release of the inspection report *prior to* when the auditor has an opportunity to improve effort and scrutiny directed to level 2 and level 3 fair value assets. We find that information uncertainty increases in the quarter after the issuance of the PCAOB inspection report. This suggests that the report may temporarily increase information uncertainty before the auditor has an opportunity to intervene. We also provide evidence showing that the reduction in information uncertainty after the inspection event is not explained by issuer clients selling off difficult to value fair value assets after an inspection event. Lastly, our results are robust to alternative measures of PCAOB deficiencies and information uncertainty.

Our research contributes to the literature in the following ways. First, we show PCAOB inspections serve as a monitoring mechanism to mitigate information uncertainty for fair value assets through the communication of deficiencies in the inspection report. Prior literature finds

[2] Studies have suggested that managerial opportunism may inject bias in the classification decisions between level 2 and 3 estimated assets. Hence, Botosan, Carrizosa and Huffman (2011) and Bens, Cheng and Neamtiu (2016) combine level 2 and level 3 estimates in operationalizing tests of hypotheses. Our study provides results for these estimates combined and separated.

diminished value relevance (Song, Thomas and Yi 2010) and higher information uncertainty (Riedl and Serafeim 2011) associated with fair value assets designated as level 2 and level 3. In addition, prior research suggests that variation in opacity across fair value designations is mitigated by regulatory intervention by the SEC compliance process (Bens, Cheng and Neamtiu 2016). We find information uncertainty associated with level 2 and, in certain specifications, level 3 fair value assets, is lower following the release of a FV deficient inspection report. Therefore, we document an additional mechanism – the PCAOB inspection process – by which the opacity issues related to fair value assets are mitigated.

Second, we contribute to growing literature that examines the auditor's role in evaluating and providing positive assurance for fair value estimates. Prior literature on fair value demonstrates the difficulties encountered by auditors in evaluating the estimates of complex fair value assets (e.g., Bedard and Canon 2017). These difficulties include managers' and auditors' lack of expertise in valuation methodologies (Griffith et al. 2014), the lack of clear guidance in current audit standards that govern the audit of fair value estimates (Glover et al. 2017), and the underlying volatility of model inputs that may change rapidly in the face of shifting environmental conditions (Christensen et al. 2012). Whether auditors can provide positive assurance for certain highly-complex fair value instruments is an open question. Our evidence is consistent with auditors mitigating the risk of uncertainty surrounding fair value estimates.

Third, we contribute to the literature on whether the content of PCAOB inspection reports improves financial reporting quality. Prior literature examines the association between the existence and number of deficiencies in PCAOB inspection reports and audit quality (Lennox and Pittman 2010; DeFond and Lennox 2011; Gipper, Leuz, and Maffett 2015; Lamoreaux 2016). More recent studies examine the association between the *content* of PCAOB inspection

reports and audit quality (Acito et al. 2017; Defond and Lennox 2017). Defond and Lennox (2017) find that PCAOB inspections related to internal control deficiencies improve the quality of internal control audits. Acito et al. (2017) find higher exposure by issuer clients to deficient standards leads to increased audit fees and more auditor turnover. We find PCAOB inspections related to fair value deficiencies improve financial reporting quality by reducing information uncertainty surrounding fair value assets, making our study one of the first to examine the financial reporting implications of PCAOB inspection reports.

Our study proceeds as follows. Section 2 explores background information regarding fair values and the PCAOB inspection process as well as prior related literature. Section 3 motivates and develops hypotheses. Section 4 discusses the research method and sample description. Section 5 provides an analysis and discussion of results. Section 5 offers preliminary sensitivity analysis and Section 7 concludes.

2 Background Information

2.1 Fair Value Estimates and Reporting under SFAS 157

The Financial Accounting Standards Board (FASB) issued SFAS 157 in 2006, allowing adoption of the standard beginning in 2007 and requiring adoption for fiscal years ending after November 15, 2007. This standard defines fair value as "the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date." The standard also introduces a three-tier classification system to distinguish between fair value estimates that were determined by management through procedures of varying objectivity. In particular, level 1 inputs are those estimates derived from quotable prices in active markets for assets and liabilities that are identical to the asset or liability being measured. Level 2 inputs represent estimates derived from observable quoted prices of identical

assets and liabilities in *inactive* markets, or *similar* assets and liabilities in active markets, as well as inputs other than quoted prices that are observable and related to the value of the asset (e.g., yield curves, price indices or exchange rates). Hence, level 2 estimates may lack the precision of level 1 estimates due to illiquid markets or volatile inputs that may increase the variance of the estimate itself under shifting economic trends. Level 3 estimates (typically considered the most opaque) represent unobservable, management-supplied estimates and forecasts sometimes derived from valuation models and assumptions (e.g. forecasted home price depreciation and credit loss severity on mortgage-related positions), resulting in "mark-to-model" rather than mark-to-market valuations of assets and liabilities that are "largely undisciplined by market information" (Riedl and Serafeim 2011, pg. 1086). Because these estimates lack reliability and are largely subjective, expanded disclosures are required for level 3 estimates.

2.2 PCAOB Inspection Reports and Audits of Fair Value Estimates

The PCAOB is a nonprofit corporation created by the Sarbanes-Oxley Act of 2002 to oversee the audits of public companies to further protect the interests of the investing community. A noteworthy way in which the Board executes this charge is by inspecting the audit and assurance processes of auditing firms that audit (or assist in the audit of) issuer companies around the world. Through these inspection reports, the PCAOB may highlight minor or significant concerns in the execution of an audit. The PCAOB focuses its inspection efforts at the engagement-level and reports its results (if any deficiencies are detected) at the audit-firm level.[3] It bases its inspection decisions on an internal risk-based model and inspects those engagements for which it believes the risk of audit failure is highest.[4]

[3] The PCAOB does not publicly disclose which audit engagements it inspects.
[4] The PCAOB is studying the use of a random process (rather than risk-based) to select some engagements for inspection. (Ryan 2017).

One area given intense scrutiny by the PCAOB in recent years has been the audit processes surrounding the measurement and estimation of financial assets and liabilities that are reported at fair value on the balance sheets of corporations (VRC 2013). The PCAOB has three standards to guide the audit process of fair value estimates: AS 2501, *Auditing Accounting Estimates*; AS 2502, *Auditing Fair Value Measurements and Disclosures*; and AS 2503, *Auditing Derivative Instruments, Hedging Activities and Investments in Securities Related to the Audit of Derivative Instruments*. All of these standards predate the issuance of SFAS 157 and the creation of the current three-tier system of estimation. In addition, the PCAOB has issued six practice alerts since 2007 related to fair value assets and estimates, which arose in the environment of growing concern surrounding the audit of fair value instruments during the financial crisis.

The relatively high frequency of fair value deficiencies (Glover et al. 2017), the perceived inconsistencies of current audit standards and the growing use of third-party specialists in determining fair value measurements led the PCAOB to issue Release No. 2017-002, *Proposed Auditing Standard –Auditing Accounting Estimates, Including Fair Value Measurements and Proposed Amendments to PCAOB Auditing Standards*. While the feedback regarding the formation of a new standard or the potential modification of existing standards has been mostly positive, audit firms continue to express concern that the PCAOB recognize the inherent subjectivity and imprecision associated with auditing complex fair value estimates.

3 Hypothesis Development

It is possible that PCAOB inspection reports do not reduce information uncertainty associated with disclosures of level 2 and level 3 fair value assets. Glover et al. (2017) and Christensen et al. (2012) cast doubt on whether auditors will be able to meet the current expectations of precision held by regulators and reflected in inspection report deficiencies. For

example, Christensen et al. (2012, p. 143) state "No amount of auditing can remove the extreme uncertainty inherent in reported values derived from management's valuation models based on unobservable inputs subject to estimation uncertainty."[5] Given the subjective and unobservable nature of certain fair value inputs and estimates, increased testing and scrutiny by auditors may not result in reducing information uncertainty associated with fair value assets or all fair value assets equally.

However, substantial empirical evidence suggests that the PCAOB inspection process can result in financial reporting quality improvements. For example, Carcello, Hollingsworth and Mastriola (2011) document that inspection reports tied to Big 4 auditors lead to decreased discretionary accruals in future periods. DeFond and Lennox (2017) find that internal control deficiencies in the PCAOB inspection report lead to higher quality internal control audit reports, while Acito et al. (2017) finds higher exposure by issuer clients to deficient standards mentioned in the PCAOB report leads to increased auditor turnover. Further, DeFond and Lennox (2017) and Acito et al. (2017) provide evidence that audit fees increase after the issuance of deficient inspection reports, suggesting increased efforts in response to problematic areas documented in these reports. Using the staggered introduction of the inspection process as a natural experiment, Gipper, Leuz, and Maffett (2015) show that market reaction to unexpected earnings increases for issuers affected by the new PCAOB inspection regime, compared to a control sample not so affected. In a qualitative study using questionnaires and interview techniques, Westermann,

[5] Christensen et al. (2012) demonstrate how small and defensible adjustments to model inputs can result in changes to estimates that exceed the threshold of audit materiality. In one example, the authors highlight that a change of 25 basis points in General Motor's 2002 discount rate increases 2003 pretax net income by $120 million, reduces 2002 pension obligation by $1.8 billion and 2002 equity by $1.1 billion while the audit materiality was estimated at $104 million.

Cohen and Trompeter (2018) show that auditors and audit firms change their behavior in reaction to Part I findings received from the PCAOB.

Further empirical evidence comes from Aobdia (2018). Using proprietary PCAOB data, Aobdia (2018) shows that audit firms receiving deficient PCAOB inspection reports react by increasing effort (measured by audit hours) on both the inspected engagement and non-inspected engagements both within the office of the inspected engagement and the firm's other offices. This suggests that issuer clients of the audit firm as a whole may benefit from the spill-over effects of a deficiency in the PCAOB inspection report even if the deficiency did not occur on the client's audit engagement.

Overall, the potential for improvements in the level of effort and scrutiny directed to level 2 and level 3 holdings after the inspection event suggests monitoring by the PCAOB may be an effective tool in enhancing the disclosure of fair value estimates. Audit firms that receive FV deficient inspection reports will likely increase scrutiny and testing of their issuer clients, which could lead to an increase in disclosure quality and a reduction in information risk of level 2 and level 3 fair value estimates. This leads to our hypothesis:

H1: Information risk associated with level 2 and level 3 fair value asset holdings will decrease in the fiscal year of a fair value deficient inspection.

4 Research Method

We measure information uncertainty (risk) in the spirit of Lambert, Leuz and Verrechia (2007) who derive a model establishing the presence of undiversifiable information risk. They argue that this risk arises from two sources: (1) directly from investors' assessments of the covariance of the firm's future cash flows with those of other firms and (2) from operational and investment decisions arising from higher quality information that change the expected value and covariance of cash flows with other firms. Lambert et al. (2007) provide evidence that increases

in the quality of information or disclosures can directly impact the assessed covariance of cash flows and alter the cost of capital for the firm and that this effect may be captured in a firm's market beta. To the degree that FV deficient inspection reports increase auditor vigilance over client processes and estimates, increased efficiency in processes and valuations of complex estimates should reduce information risk in these estimates.

To study whether FV deficient inspection reports yield significant changes in the information uncertainty for level 2 and level 3 fair value estimates, we adopt a methodology used by Riedl and Serafeim (2011) that examines asset-specific betas of fair value assets—a proxy for information uncertainty—for issuer clients before and after the issuance of an inspection report to the auditor. Because full audit processes are unlikely to be performed on interim financial statements, we select data from the first annual report after the issuance of a FV deficient inspection report to measure variables in testing for the effects of reduced information uncertainty.

Riedl and Serafeim (2011) derive asset-specific betas through manipulations of the balance sheet identity (A=L+E). First, they decompose assets into level 1, level 2, level 3 designations and assets not measured at fair value (A = FVA1 + FVA2 + FVA3 + NFVA) and substitute this into the balance sheet identity. They then divide through by total assets to provide the following derivation of a weighted-average beta for each firm:

$$\beta_{A1}\frac{FVA1}{A} + \beta_{A2}\frac{FVA2}{A} + \beta_{A3}\frac{FVA3}{A} + \beta_{OA}\frac{NFVA}{A} = \beta_{L}\frac{LEV}{A} + \beta_{E}\frac{E}{A} \quad (1)$$

Where:

FVA1, FVA2, FVA3 = fair value of assets designated at levels 1, 2 and 3;
NFVA = other assets not measured at fair value;
A = total assets;
LEV = total liabilities; and
E = book value of total equity.

Rearranging to solve for equity beta yields:

$$\beta_E \frac{E}{A} = \beta_{A1} \frac{FVA1}{A} + \beta_{A2} \frac{FVA2}{A} + \beta_{A3} \frac{FVA3}{A} + \beta_{OA} \frac{NFVA}{A} - \beta_L \frac{LEV}{A} \tag{2}$$

Riedl and Serafeim (2011) test this model in their primary analysis to determine whether information uncertainty increases over the designation of fair value estimate levels 1, 2 and 3. We modify their approach to determine whether inspections yield a moderating influence on information uncertainty by estimating the following regression framework for all issuers in our sample:

$$\begin{aligned} Beta\_adj_{it} = {} & (\alpha_1 FVA1_{it} + \alpha_2 FVA2_{it} + \alpha_3 FVA3_{it}) + FVDEF \\ & + FVDEF \times (\alpha_{1a} FVA1_{it} + \alpha_{2a} FVA2_{it} + \alpha_{3a} FVA3_{it}) + \alpha_4 NFVA_{it} \\ & + \alpha_5 LEV_{it} + \epsilon \end{aligned} \tag{3}$$

BETA_ADJ is each firm's equity beta, assessed over the three months following the public release of its annual report for year *t*, multiplied by the ratio of the firm's book value of equity to total assets. *FVDEF* represents the intensity of fair value deficiencies in a PCAOB inspection report and is calculated as the ratio of issuers receiving a fair value deficiency to the total number of deficient issuers listed in the report.[6] We ensure that the issue date of the FV deficient inspection report occurs before the fiscal year-end to allow for improvements to controls, audit procedures or other potential deficiencies in the disclosure practices of the audit firm's issuer clients.[7] All other variables are as defined in the appendix.

As previously mentioned, we assess equity beta by the single-factor CAPM model:

[6] We also construct an alternate version of this variable, measuring the number of fair value deficiencies in an inspection report to the total number of deficiencies in an inspection report, but due to the subjectivity in determining the number of individual deficiencies, we chose to report the less granular measure of the intensity of fair value deficiencies. Irrespective, our calculation of the ratio of number of deficiencies to total deficiencies was highly correlated to *FVDEF* and yielded similar results.

[7] We use the public issue date of the inspection report similar to Defond and Lennox (2017). To the extent that the audit firm learns information about fair value estimate deficiencies prior to the public release of this report, choosing this date biases against our results. We also run (untabulated) models using the "end of inspection" date which occurs prior to the issue date of the report, to create our *INSPECT* variable with similar results.

$$RET_{it} = \delta_0 + \delta_1 VW\_RET_{it} + \varphi_{it} \quad (4)$$

We assess beta using daily-return data beginning three months after the fiscal year-end to ensure that financial information is publicly available. Fair value measures (*FVA1*, *FVA2* and *FVA3*) capture market values yet are reported as book values on the balance sheets of issuer clients. To remain consistent, we use book values to capture total equity, total assets, total liabilities and the value of other assets not measured at fair value. If equity beta is the linear combination of weighted betas, we anticipate α_1, α_2, α_3, and α_4 from equation (3) to be positive and α_5 to be negative, in line with equation (2). The empirical estimates of these regression coefficients are the implied betas based on the distribution parameters of the market value of equity and the audited fair value of assets that management reports (Riedl and Serafeim 2011).

In line with prior studies (Riedl and Serafeim 2011; Song et al. 2010), we anticipate $\alpha_1 < \alpha_2 < \alpha_3$ owing to the increased uncertainty associated with level 2 and level 3 asset disclosures, although we do not formally test this. Hypothesis 1 tests whether $\alpha_{2a} < 0$ and $\alpha_{3a} < 0$, which would suggest that fair value deficiencies noted in PCAOB inspection reports result in reductions in the association of information uncertainty with level 2 and level 3 assets. Because level 1 fair value estimates are based on readily available price quotes from active markets, we do not anticipate that inspection deficiencies will bring improvements to the evaluation and general audit processes involved with level 1estimates; hence, we make no prediction for α_{1a}.

Similar to Bens et al. (2016), we also test a modified version of this model where *FVA2* and *FVA3*—the ratio of fair value assets estimated by level 2 and level 3 inputs, respectively—are combined into a single variable *FVA23*. Botosan, Carrizosa and Huffman (2011) argue that designations of level 2 and level 3 assets may result from strategic considerations outside of the original intent of SFAS No. 157. Kohlbeck, Smith and Valencia (2017) also provide evidence

that auditors may curb their clients' reclassification of assets as level 3 assets, especially when such transfers are regarded as managerially opportunistic. Finally, prior research (e.g. Chircop and Novotny-Farkas 2016) suggests the presence of a "return to liquidity" effect, wherein certain financial assets that suffered from severe market illiquidity stemming from the financial crisis were eventually reclassified as level 2 or level 1 assets once the crisis abated and markets became "orderly" again with increased liquidity. Regardless of the reason for reclassification, we perform this modification to ensure that transfers between level 2 and level 3 assets do not bias the results of our tests; hence, *FVA23* equals the fair value of designated assets at levels 2 and level 3, scaled by total assets.

$$Beta\_adj_{it} = (\gamma_1 FVA1_{it} + \gamma_2 FVA23_{it}) + INSPECT + INSPECT \times (\gamma_{1a} FVA1_{it} + \gamma_{2a} FVA23_{it}) + \gamma_3 NFVA_{it} + \gamma_4 LEV_{it} + \epsilon \quad (5)$$

Both equations (4) and (5) include year fixed effects and audit firm fixed effects in line with Defond and Lennox (2017) with standard errors clustered at the bank-level.

5 Sample Selection

We use the Audit Analytics database to identify audit firms receiving a fair value deficient inspection report from the PCAOB. This results in 134 inspection reports for annually and triennially inspected audit firms that note fair value deficiencies during the fiscal years 2008-2015. Once inspection reports of audit firms domiciled outside of the US are eliminated, we have a sample of 123 inspection reports remaining. We then form a sample of all issuers reporting non-zero level 2 or level 3 fair value assets during the sample years 2008-2015.[8] Then, we restrict the sample to issuers in the financial services industry.[9] From this, we pair each bank

[8] To the extent the financial crisis influences our results, in sensitivity analysis we exclude observations from 2008 and find that our main results are unaltered.

[9] This is consistent with prior literature (Riedl and Serafeim 2011) as financial service firms tend to face the most exposure to assets subject to fair value estimation techniques.

issuer-client with its audit firm and construct the *FVDEF* variable from inspection report data. We then pull all relevant financial information concerning fair value assets from the Compustat Bank file. After eliminating triennially inspected audit firm issuer clients, and deleting all observations without complete data from CRSP, Audit Analytics, and the FR-Y9C reports used to construct variables in our analyses, we have 1,493 issuer-years.[10]

Table 1, Panel A details the sample selection procedure, while Panel B displays the frequency of FV deficient inspection reports released by the PCAOB on annually inspected audit firms in each year. We note that while annually inspected audit firms commonly receive fair value deficiencies in a given year, the construction of FVDEF contains variation because the proportion of issuer clients experiencing fair value deficiencies to the total issuer clients mentioned in an inspection report varies for each audit firm and from year-to-year.[11]

[INSERT TABLE 1 HERE]

Table 2, Panel A contains descriptive statistics for the full sample and the sample bifurcated between issuer clients of Big 4 and non-Big 4 audit firms. All variables, except *FVDEF*, are winsorized at the first and 99th percentiles by fiscal year and by whether the issuer client employs a Big 4 or non-Big 4 auditor.[12] Because the value of assets estimated at each level varies substantially, we report descriptive statistics for our three fair value variables—*FVA1*, *FVA2* and *FVA3*— along with other variables in our main analysis in Panel A of Table 2.

[10] We delete triennial firms for two reasons: (1) the relative dearth of observations arising from triennial inspections creates potential issues for statistical power, and (2) because triennial firms are inspected only once every three years, while annual firms are inspected each year, comparisons between the subsamples could be confounded by the failure to inspect at an equivalent frequency.

[11] In untabulated sensitivity analyses, we conduct our regression estimations based on other specifications, including the proportion of fair value deficiencies to total deficiencies in a given report, a 0/1 dichotomous variable that indicates the existence of a FV deficient report with any number of fair value deficiencies, and a count of the number of FV deficient inspection reports issued for a particular audit firm during the sample period. All definitions yield results similar to those reported in our multivariate analyses.

[12] Trimming at the first and 99th percentiles by this method results in no substantial alterations to the conclusions of our analysis.

[INSERT TABLE 2 HERE]

Similar to prior studies, we document greater concentrations of level 2 estimates (18.2% of total assets for the full sample) than concentrations of either level 1 (0.8% of total assets) or level 3 estimates (0.4% of total assets). Panel B of Table 2 presents statistical tests of differences of means between Big 4 and non-Big 4 audit firm issuer clients. Within the distinction of Big 4 versus non-Big 4 audit firms, Big 4 issuer clients hold significantly more level 1 assets and level 3 assets (0.6% less of level 1 assets to total assets and 0.2% less of level 3 assets to total assets) than do non-Big 4 audit firm issuer clients. The issuer clients of non-Big 4 audit firms have relatively less risk as proxied by *BETA_ADJ* than do issuer clients of Big 4 audit firms. Finally, significant differences in *FVDEF* indicate that FV deficient inspection reports of Big 4 audit firms tend to have greater proportions of issuer clients with identified FV deficiencies than do non-Big 4 audit firms.

Table 3 presents a correlation matrix for our main analysis variables and variables of note in subsequent sensitivity tests that support the main analysis. *BETA_ADJ* and *FVA3* are positively and significantly associated according to both Spearman and Pearson coefficients, while *BETA_ADJ* and *FVA1* are significantly and positively associated in Spearman coefficients. These results suggest that on a univariate basis, both level 3 and level 1 assets increase with equity-beta though likely for differing reasons;[13] however, *BETA_ADJ* and *FVA2* reveal no significant relationship. While the pattern of univariate associations exhibited by these coefficients suggests that level 3 and level 1 assets exhibit risk characteristics to a greater extent than do level 2 assets, these interpretations should be qualified as *FVA1*, *FVA2* and *FVA3* are each positively and significantly associated with each other. *FVDEF*, our construct representing

[13] Specifically, level 3 likely contain increased information risk, while level 1 inputs, based on quoted market prices, likely reflect, in part, the covariance of the market beta.

the intensity of fair value deficiencies in an inspection report, is positively and significantly associated with *FVA2*, but not *FVA1* and *FVA3*, perhaps owing to the greater proportion of *FVA2* assets owned by issuer clients.

[INSERT TABLE 3 HERE]

6 Multivariate Analysis

Table 4, Panel A presents results from our main regression analysis with standard errors clustered by bank issuer-clients. Regression results are broken into four columns based on (1) whether *FVA2* and *FVA3* are regressed separately or in combination and (2) the fixed effects included in the model. In Panel A, Columns (1) and (3) we include estimation results with only year fixed effects to demonstrate the comparability of the estimated coefficients for our fair value asset main effects with those of Riedl and Serafeim (2011). Notably, in Column (1), the estimated coefficients for *FVA1*, *FVA2* and *FVA3* are all positive and significant 0.95, 1.068 and 1.346 respectively.

[INSERT TABLE 4 HERE]

For the remainder of our results analysis, and in Columns (2) and (4), we include audit firm fixed effects in line with Defond and Lennox (2017) even though the inclusion of these additional controls distorts coefficient estimates for our main effects. Controlling for audit firm and year fixed effects together amounts to a difference-in-differences estimation with an on-going treatment effect (DeFond and Lennox 2017). The results of all four columns generally support our hypothesis, documenting reductions in information uncertainty that increase in the intensity of fair value deficiencies contained in an inspection report.

The estimated regression coefficient for the interaction term *FVA2*FVDEF* is negative and significant in both Columns (1) and (2), indicating that after a FV deficient inspection report

is issued, level 2 fair value assets exhibit a reduction in their association with *BETA_ADJ*, our proxy for information uncertainty. The estimated coefficient for *FVA3*FVDEF* is not significant in either Column (1) or Column (2). This finding may suggest that while PCAOB inspection reports containing fair value deficiencies are useful in reducing uncertainty for level 2 fair value assets, they may not necessarily improve the information content of level 3 fair value asset disclosures. The inability to reduce uncertainty surrounding level 3 fair value assets corroborates arguments expressed by Christensen et al. (2012) and anecdotal evidence reported by Glover et al. (2017) that estimates based on managerial inputs may simply be too subjective to effectively audit and report with elevated precision.

Columns (3) and (4) of Table 4 disclose results when level 2 and level 3 fair value assets are combined in our regression model, and both estimations support our first hypothesis. The estimated coefficient for *FVA23*FVDEF* is negative and significant in both specifications, suggesting that fair value deficient inspection reports are effective in decreasing information uncertainty surrounding these estimates, even when controlling for transfers between level 2 and level 3 assets that may arise due to managerial opportunism, differences in audit quality or changes in market liquidity.

The estimated regression coefficients for the control variables are significant and in the predicted direction. The coefficient of *NFVA* exhibits a positive and significant association with *BETA_ADJ*, and the *LEV* coefficient has a negative and significant association with *BETA_ADJ*. Consistent with Bens et al. (2016), we note that the estimated coefficients for *FVA1*FVDEF* are positive and significant. Although we make no formal prediction for this estimate, the positive coefficient suggests that fair value assets designated as level 1 exhibit an increased association with *BETA_ADJ* after the issuance of FV deficient inspection reports with higher proportions of

deficient issuers to total issuers. While this appears counterintuitive—since level 1 inputs are based on quoted prices in actively traded markets for identical assets and should be more transparent than level 2 or level 3 estimated assets—Bens et al. (2016) show similar results for level 1 assets after the issuance of a SEC comment letter, documenting that the association with level 1 assets and their proxies for information risk increase after the issuance of a comment letter.

Results Partitioned by Exposure to Level 2 and Level 3 Assets

Because auditor resources are limited, it stands to reason that auditors will react most strongly in the case of issuer clients that face greater exposure to the deficiencies contained in inspection reports. Specifically, in our setting, this corresponds to issuer clients that hold greater proportions of complex fair value assets. To further explore our primary result and provide corroboration that reductions in uncertainty are driven by audit firm efforts, resulting in changes of issuer client disclosure environments, we partition the sample by issuer client exposure to level 2 and level 3 assets. Specifically, we designate high risk exposure as those issuer clients who have greater than the median *FVA23* by audit firm and fiscal year. We construct our partition in this manner to account for differences in the market share and issuer client profile of audit firms, understanding that certain audit firms likely have higher proportions of issuer clients with greater risk exposures to level 2 and level 3 assets than other audit firms.

Panel B of Table 4 presents our regression results separated into high exposure versus low exposure issuer clients, again clustered by issuer and controlling for year and audit firm fixed effects. Overall, the results of the estimations suggest that reductions in information uncertainty are driven by changes in the information environment of issuer clients that face high

exposure to level 2 and level 3 assets. These findings are complementary to audit firms being most responsive to issuer clients that are particularly exposed to FV deficiencies.

Columns (1) and (2) provide regression analyses between these subsamples when *FVA2* and *FVA3* are separately estimated. Column (1) presents the regression results for issuers who rank above the median FVA23 exposure of their auditor. The estimated regression coefficient for *FVA2*FVDEF* is negative and significant, $p<0.01$. The low risk exposure subsample reported in Column (2) reveals a negative but insignificant coefficient for *FVA2*FVDEF*.

Columns (3) and (4) provide estimations that combine level 2 and level 3 estimated assets for high exposure and low exposure issuer clients, respectively. When estimated in combination, the coefficient for *FVA23*FVDEF* is negative and significant for the high exposure subsamples ($p<0.01$) yet insignificant for the low exposure subsample. We also note that the counterintuitive result for the coefficient on the interaction of FVA1 and FVDEF in Panel A seems driven by issuer clients that rank in the low exposure subsamples.

In sum, the results reported in Panel A and Panel B of Table 4 support a reduction in implied asset-specific betas for complex fair value estimates after FV deficient inspection reports are publicly issued. We take the reduction in these estimated coefficients as evidence that FV deficient inspection reports are associated with a reduction in information risk. Furthermore, results in Panel B suggest that the reduction of information risk is most notable for issuer clients that pose significant exposure risks for their audit firms, indicating that audit firms may make strategic decisions regarding scarce resources in addressing the deficiencies listed in inspection reports. Finally, when we combine level 2 and level 3 assets to reduce the bias of any opportunistic classification, we find consistent evidence of a reduction in the association of

BETA_ADJ with *FVA23* that increases in the intensity of FV deficiencies contained in an inspection report.

Overall, the tenor of our results provides evidence that the information environment surrounding complex fair value disclosures is enhanced with regard to investors' interpretation of financial reports following the issue of a FV deficient inspection. We now turn sensitivity analyses, which underscore, in part, the role of the auditor in this process.

7 Sensitivity Analyses

7.1 PCAOB Deficiencies and Subsequent Audit Effort

If improvements to information uncertainty result from increased auditor effort and focus, then we may detect changes in auditor effort or behavior after an inspection report. We explore shifts in auditor equilibrium on two dimensions: auditors' deterrence of transfers into level 3 and increases in audit fees charged that are associated with complex fair value estimates after a FV deficient inspection reports. Prior research hypothesizes that transfers present a potential source of managerial opportunism (Botosan et al. 2011), as management may provide its own set of unobservable inputs to value them. Kohlbeck et al. (2017) corroborate this view, finding that high quality auditors reduce the amount of transfers into level 3 assets, especially when such transfers are likely to be a source of managerial opportunism. Consequently, we believe higher quality audit procedures in general should lead to reduced transfers into level 3 estimated assets. With respect to audit fees, Ettredge, Xu and Yi (2014) find that fair value estimate holdings increase the audit fees charged to issuer clients, while DeFond and Lennox (2017) provide evidence that audit effort increases after the issuance of an inspection report that expresses deficiencies over firms' internal control weaknesses. Following these studies, to the extent deficient PCAOB inspection reports related to fair value spur auditors to conduct higher quality

audits with more rigorous testing of fair value assets (and the clients absorb those costs), we would expect transfers into level 3 assets to decrease and audit fees to increase.

To test for transfers into level 3 assets, we hand collect information from fair value footnotes regarding these transfers and estimate the following model, developed by Kohlbeck et al. (2017):

$$LN\_TRANSFERS_{it} = \alpha_1 FVDEF + \alpha_2 NFVA_{it-1} + \alpha_3 FVA123_{it-1} + \alpha_4 CHG_{ASSET\,it} + \alpha_5 LN\_TRANSFERS_{it-1} + \alpha_6 MTB_{it} + \alpha_7 TCAP_{it-1} + \alpha_8 SIFI + \alpha_9 BIG4_{it} \quad (6)$$

LN_TRANSFERS equals the natural log of net transfers into level 3 if positive and zero otherwise. As the dependent variable is left-censored, we employ a tobit estimation method. Should *FVDEF* result in high quality audits and auditors' increased vigilance over transfers into level 3 designations, we anticipate that $\alpha_1 < 0$.

[INSERT TABLE 5 HERE]

Consistent with our predictions, Table 5 reveals that the estimated coefficient on *FVDEF* is negative and significant. This suggests that auditors curtail transfers into level 3 designations following the issuance of an inspection report and that the curtailment is increasing in the proportion of fair value deficient issuers to total deficient issuers. We interpret this evidence as supportive of the role played by auditors in the shifting information environment following an inspection report. To the extent that higher quality audits tend to reduce the movement of fair value assets into level 3 (Kohlbeck et a. 2017), it appears that FV deficient inspection reports increase this tendency. We now explore the possibility of increased audit effort following FV deficient reports.

To test for potential shifts in audit effort, we use an audit fee model designed for the banking industry, developed by Fields Fraser and Wilkins (2004) and used by Ettredge et al. (2014) in documenting that fair value asset holdings are positively associated with audit fees. We modify the model to analyze the auditor response to an inspection event as follows:

$$\begin{aligned} LnAFEES_{it+1} = {} & (\alpha_1 FVA1_{it} + \alpha_2 FVA2_{it} + \alpha_3 FVA3_{it}) + \alpha_4 INSPECT \\ & + INSPECT \times (\alpha_{1a} FVA1_{it} + \alpha_{2a} FVA2_{it} + \alpha_{3a} FVA3_{it}) + \alpha_5 LnASSET_{it} \\ & + \alpha_6 BIGN_{it} + \alpha_7 LOSS_{it} + \alpha_8 STDRET_{it} + \alpha_9 TRANSACCT_{it} \\ & + \alpha_{10} SECURITIES_{it} + \alpha_{11} EFFICIENCY \\ & + \alpha_{12} COMMLOAN_{it} + \alpha_{13} NONPERFORM + \alpha_{14} CHGOFF_{it} \\ & + \alpha_{15} MTGLOAN_{it} + \alpha_{16} CAPRATIO_{it} + \alpha_{17} INTANG_{it} + \alpha_{18} SENSITIVE_{it} \\ & + \alpha_{18} SAVING_{it} + \epsilon \end{aligned} \quad (7)$$

Results from Ettredge et al. (2014) suggest that additional audit efforts are necessary to provide assurance for subjective fair value estimates. If FV deficient inspection reports result in increased audit efforts, specifically to fair value asset holdings that require verification of subjective and difficult-to-value estimates (i.e. level 2 and level 3), then we would anticipate that $\alpha_{3a} > 0$ and $\alpha_{2a} > 0$. Though findings from Ettredge et al. (2014) suggest that level 3 estimated assets have a greater fee premium than do level 1 and level 2 assets, we allow for the possibility that level 2 asset premiums may rise after an inspection event. Because level 1 inputs are based on quoted market prices, which should—in theory—be easily verifiable, we make no prediction for α_{1a}.

[INSERT TABLE 6 HERE]

Table 6 presents results from the estimation of our audit fee model for the full sample. Results in Column (1) reveal a positive and significant regression coefficient for *FVA3*FVDEF*. This suggests that after a FV deficient inspection reports is issued, the association of audit fees with level 3 fair value estimates increases. These results are in line with prior findings from Ettredge et al. (2014), who find that audit fee premiums for fair value assets are more positively

associated with level 3 fair value estimated assets than level 2 or level 1 fair value estimated assets. The coefficient of level 2 fair value assets is negative and insignificant. Examining these findings for audit fees in light of the transfer result of Table 5, it is possible that audit fees increase as do auditor efforts to deter transfers into level 3 assets (similar to findings in Kohlbeck et al. 2017). When level 2 and level 3 assets are combined, as in Column (2), the coefficient for the interaction term *FVA23*FVDEF* is negative and insignificant.

7.2 PCAOB Deficiencies and Changes in Fair Value Footnote Disclosure

We hand collect data about disclosures in the fair value footnote (number of words and asset and liability categories) to provide additional support for the "spillover" effects to issuers of increased monitoring by auditors after the issuance of a deficient FV report. Similar to Bens et al. (2016), we measure disclosure in the fair value footnote to provide evidence of increased disclosure practices after the issuance of a FV deficient inspection report. Table 7, Panel A, provides descriptive statistics for three measures of real changes to issuer client disclosures.

[INSERT TABLE 7 HERE]

Loughran and McDonald (2014) provide evidence that 10-K file size provides a simple and effective proxy for readability. As such, we collect *LN_WORD* which represents the natural log of the number of words in each issuer client's fair value footnote disclosure. Next, we count the number of categories into which each issuer-client breaks its fair value asset and liability estimates measured on a recurring basis (*ASSET_CAT* and *LIAB_CAT*, respectively).

Table 7, Panel B shows that following a FV deficient inspection report, average *LN_COUNT* increases ($p<0.01$), while the average *ASSET_CAT* and *LIAB_CAT* increase by 2.22 and 0.43 categories, respectively ($p<0.01$). These results provide evidence of changes in the disclosure practices of issuer clients that corroborate the association of increased audit fees

following a deficient inspection report. Table 7, Panel C repeats this analysis with similar results but breaks the partition between those issuers with *FVDEF* greater than the median value and those with equal or lesser value of *FVDEF*. Overall, these results suggest that issuer clients change disclosures following FV deficient inspection reports and that these disclosure changes are particularly salient for clients of audit firms receiving inspection reports with a greater proportion of fair value deficient issuers to total issuers mentioned.

7.3 PCAOB Inspections and SEC Comment Letters

To provide evidence that our results are incremental to Bens et al. 2016, who find that proxies for risk decrease for banks that receive SEC comment letters related to FV, we partition our main analysis in Table 4, Panel A into subsamples based on whether the client received a FV-related SEC comment letter. We report the results of this analysis in Table 8.

[INSERT TABLE 8 HERE]

Columns (1) and (3) of Table 8 provide regression results for the subsample of issuer-clients that did not receive a FV-related comment letter during our sample period, while Columns (2) and (4) provides results from estimating the same model on issuer-clients that did receive a FV-related comment letter during the fiscal year. As demonstrated in Table 8, Columns (1) and (3) we find a negative and significant coefficient estimate for *FVA2*FVDEF* and *FVA23*FVDEF*, indicating that the information uncertainty reduction documented in Table 4 remains in the absence of comment letters. The coefficient estimates for *FVA2*FVDEF* and *FVA23*FVDEF* are negative and significant in Column (2) and Column (3). Therefore, despite the presence of comment letters, we find a negative and significant coefficient estimate suggesting that the PCAOB inspection process related to fair value is complementary to the comment letter process related to fair value.

7.4 Omitted Variables

7.4.1 Quarterly Response to FV Deficient Inspection Reports

To provide assurance that our results are not due to an omitted variable that is correlated to the issuance of FV deficient inspection reports, we examine the market response to the release of the inspection report *prior to* the audit firm's opportunity to engage the issuer client and make corrective actions in an audited annual report. Hence, we study the market response to fair value estimated asset disclosures in the quarter prior to the release of a FV deficient inspection report and compare it to the market response to such disclosures in the quarter after the release of the inspection report. Ostensibly, if PCAOB inspection reports provide information regarding poor audit quality, and investors are able to link auditors with potential clients, we may find evidence that problematic FV-estimation procedures uncovered by inspection reports induce greater uncertainty with respect to complex fair value estimates prior to auditors being able to intervene and establish better practices and enhanced disclosures.

We gather quarterly bank data regarding fair value assets and estimate equity betas similarly to our main analysis but begin the estimation of returns after the quarterly earnings announcements that book-end the public issue of the inspection report and limit the number of days to 15 (rather than 3 months) after each announcement.

[INSERT TABLE 9 HERE]

Table 9, Panel A, provides results of our primary model, equation (3), estimated on a quarterly basis and appended with quarter fixed effects. We eliminate fourth quarters from the analysis to prevent the influence of auditors as a mitigating factor and to avoid the inherent complications of other fourth quarter biases. After estimating our model pre- and post-inspection report issue, we apply t-tests for differences in coefficients between models. We find a positive

and significant difference in the coefficients for level 2 estimated assets, *FVA2*, suggesting that the implied asset-specific beta increased after the issue of the inspection report. This provides evidence that the issue of FV deficient inspection reports may temporarily increase information uncertainty associated with fair value estimates. This result also provides some assurance that our prior results are not due to some correlated omitted variable, unless this undocumented variable similarly affects the information risk captured after the issue of a FV inspection report. Notably, this increase corresponds to the strongest effect of our primary analysis: a subsequent reduction in the information uncertainty associated with *FVA2* in the annual report after auditors are able to intervene in the reporting process.

7.4.2 Selling Off Difficult to Estimate Fair Value Assets

To ensure that the portfolio of fair value assets does not change after inspection reports (i.e. that issuer clients do not simply sell off problematic or difficult to value fair value assets after an inspection event), we undertake a simple analysis in the changes of fair value assets between years in which a FV deficient inspection report is issued and years in which no such report is issued. As evidenced by Table 9, Panel B, only the change in *FVA2* is statistically significant. This indicates that issuer clients reduce their exposure to level 2 assets after the public issuance of a PCAOB inspection report with a fair value deficiency, but only by 0.45% as compared to the change in this portfolio in years that there is no deficient inspection.

7.5 Alternative Measure of Information Uncertainty

Following the literature in finance (Morck, Yeung and Yu 2000; Jin and Myers 2006) as well as Reidl and Serafeim (2011), we decompose the dependent variable of our main analysis, *BETA_ADJ*, into two components:

$$Beta = \rho_{im} \cdot \frac{std_i}{std_m} \tag{6}$$

Where *Beta* is the single-factor estimate from the CAPM model used to compute *BETA_ADJ*, ρ_{im} represents the correlation between the daily returns of each issuer and the value-weighted market return in the 30 days following the release of annual reports, and $\frac{std_i}{std_m}$ represents the standard deviation of issuer returns in the 30 days following the release of annual reports scaled by the standard deviation of the value-weighted return over a similar time frame. We multiply each component by the ratio of the book value of equity to total assets, similar to our construction of the *BETA_ADJ* variable, to obtain the variables *CORR_ADJ* and *STD_ADJ*. We perform this decomposition because *CORR_ADJ* is more likely to be associated with information risk components than *STD_ADJ*, which captures other fundamental risk of movements in beta. We run each as a dependent variable in our main regression analysis and present results in Table 10.

[INSERT TABLE 10 HERE]

Column (1) of Table 10 presents regression results with *CORR_ADJ* as the dependent variable and *FVA2* and *FVA3* estimated separately. We find evidence that the coefficient of *FVA2*FVDEF* is negative and significant, providing some assurance that the reduction in *BETA_ADJ* documented in prior tables is due to information risk rather than some other fundamental risk. The regression coefficient for *FVA3*FVDEF* is negative but insignificant. In Column (2) of Table 10, we report regression estimation with *STD_ADJ* as the dependent variable with *FVA2* and *FVA3* separately estimated. In this estimation, we find the regression coefficient of *FVA2*FVDEF* is negative and insignificant and the regression coefficient of *FVA3*FVDEF* is negative and significant, indicating that reductions in risk associated with level

3 assets after the issuance of a deficient inspection report may be due to factors other than information risk.

Columns (3) and (4) of Table 10 report results from estimating our regression with *CORR_ADJ* and *STD_ADJ*, respectively, with *FVA2* and *FVA3* estimated together. The results of these estimations suggest that the regression coefficient for *FVA23*FVDEF* is negative and significant when regressed on *CORR_ADJ* but negative and insignificant when regressed on *STD_ADJ*. The results in Columns (3) and (4) corroborate our hypothesis that reductions in fair value estimates association with risk are most likely due to reductions in information risk rather than other sources of risk, especially when managerial incentives are minimized by combining level 2 and level 3 fair value assets into a single variable as in Column (4) (Botosan et al. 2011).

7.6 Alternative Measures of Fair Value Deficiency

Because we choose the public issuance of the inspection report for our main analysis, to the extent that audit firms learn of the event prior to the public issuance (which is quite likely the case) our choice of event biases against our results in the main analysis. Therefore, we alter the timing aspect of the definition of our *FVDEF* variable from the public issuance of the inspection report to the end of the inspection work as reported by the inspection team. More specifically, we define three alternative variables: (1) *INSPECT,* which takes the value of 1 if a fair value deficient inspection report is issued prior to the fiscal year end of the issuer client, (2) *INSPECTNUM* which is the accumulated number of FV deficient inspection reports received since the beginning of the sample period; and (3) *FVNUM*, which is the proportion of the number of fair value deficiencies (rather than number of fair value deficient issuers) to total deficiencies broached in an inspection report or zero in a non-report year. To the extent that more fair value deficiencies (*INSPECTNUM*) or the proportion of fair value deficiencies discussed in the entire

report (*FVNUM*) capture a more severe report, we might expect auditors to respond with more effort and scrutiny directed at level 2 and level 3 fair value assets. Or to the extent that intensity of FV deficiencies does not play as crucial a role, INSPECT may play a more prominent effect than *FVDEF*. Thus, these constructs of FV deficient inspection reports may be more powerful proxies. Table 11 shows that using these alternate definitions of FVDEF do not influence our results, as the interaction term *FVA23*FVDEF* is negative and significant, as in our main results.

[INSERT TABLE 11 HERE]

8 Conclusions

Estimates of fair value remain a troublesome aspect for auditors, regulators and the companies that disclose them. Recent efforts by the PCAOB to draw new standards of guidance in the auditing of assets and liabilities reported by this method stand as testament to the incomplete and still-evolving landscape in this area. Our study addresses the information risk posed by these complex fair value instruments and the role of regulators and auditors in assuaging those risks for the investing public.

Our results suggest that PCAOB inspection reports that contain fair value deficiencies mitigate some information risk in reporting the most opaque designation of fair value estimates—those assessed by level 2 and level 3 inputs. We find that issuer clients that present the most high-risk exposure issues to their auditor exhibit the highest reduction in uncertainty following the issue of a FV deficient inspection report, suggesting auditors direct their scarce resources to clients that are most likely affected by the deficiencies.

Our results are robust to a battery of sensitivity analyses. First, in an effort to ensure the information risk reduction is due to auditors responding with increased scrutiny and testing procedures, we find decreased transfers into level 3 assets and increased audit fees after a FV

deficient report. Second, we find increased disclosure in the fair value footnote disclosure (more words and more fair value asset and liability categories) after a deficient report. Third, we find that our results—a reduction in information risk risk— are both complementary and incremental to FV-related comment letters issued by the SEC. This result suggests that the PCAOB plays an important role in regulating the application and dissemination of relevant FV information that reduces uncertainty in the financial markets. Finally, our results are robust to alternative measures of PCAOB deficiencies and information uncertainty.

Overall, our study provides evidence that the regulatory mechanism of PCAOB inspection reports aids in reducing the information risk associated with fair value estimates. These findings extend prior work by Acito et al. (2017), Aobdia (2018) and DeFond and Lennox (2017) that examine how the content of PCAOB inspection reports influence audit quality. Our study also contributes to the growing literature that examines the auditor's role in evaluating and providing positive assurance for fair value estimates (e.g. Glover et al. 2017; Griffith 2015; Griffith et al. 2015; Bedard and Cannon 2017; Christensen et al. 2013; Christensen et al. 2012). A recurring question in this work is whether auditors are able to provide assurance at the level expected by the PCAOB in auditing fair value estimates. On this dimension, we provide some initial evidence that the PCAOB's efforts through inspection reports are effective in reducing the information uncertainty surrounding these estimates.

Appendix
Variable Definitions

Inspection Event Variables	
FVDEF	the ratio of fair value deficient issuers listed in an inspection report to the total issuers listed in an inspection report
Information Uncertainty Reduction Analysis Variables	
BETA_ADJ	equity beta as assessed in the 30 days after the release of annual financial statements, multiplied by the ratio of equity to total assets
FVA1	fair value of assets designated at level 1 scaled by total assets
FVA2	fair value of assets designated at level 2 scaled by total assets
FVA3	fair value of assets designated at level 3 scaled by total assets
FVA23	fair value of assets designated at levels 2 and 3 scaled by total assets
NFVA	other assets not measured at fair value scaled by total assets
LEV	total liabilities scaled by total assets
Transfer Test Variables	
LN_TRANSFERS	the natural log of net transfers if positive and zero otherwise
LN_NFVA	the natural log of non-fair value assets
LN_FVA123	the natural log of fair value assets designated as level 1, 2 and 3
CHG_ASSET	percent growth in assets over the year
MTB	the market to book ratio of the issuer client at the beginning of the year
TCAP	the total risk-based capital ratio of the bank issuer client at the beginning of the year
SIFI	an indicator variable set to 1 if the bank qualifies as a "significantly important financial institution (assets > $50 billion) and zero otherwise
BIG 4	an indicator variable set to 1 if the audit firm retained by the issuer client is a member of the Big 4 and zero otherwise
Sensitivity Analysis Variables	
WORDCOUNT	number of words disclosed in the issuer's fair value footnote
ASSET_CAT	number of fair value asset categories disclosed in issuer's fair value footnote
LIAB_CAT	number of fair value liability categories disclosed in issuer's fair value footnote
CORR_ADJ	the correlation of each issuer's return with the value-weighted market return for the 30 days following the release of public reports
STD_ADJ	the standard deviation of each issuer's return divided by the standard deviation of the value-weighted market return for the 30 days following the release of public reports
INSPECT	a dichotomous variable coded 1 if a fair value deficient inspection was issued during the fiscal year and 0 otherwise
INSPECTNUM	the accumulated number of fair value deficient inspections received since the beginning of the sample period
FVNUM	the ratio of the number of fair value deficiencies contained in an inspection report to the total deficiencies contained in the report

Audit Fee Variables	
LnAFEES	the natural-log-transformed value of audit fees
LnASSET	the natural-log-transformed value of total assets
LOSS	a dichotomous variable coded 1 for issuers with net income less than 0, 0 otherwise
STDRET	firm-specific standard deviation of 12 monthly returns ending at the fiscal year-end
TRANSACCT	total transaction accounts divided by total deposits
SECURITIES	[1-(total securities/total assets)]
EFFICIENCY	total operating expenses divided by total revenue
COMMLOAN	the sum of commercial and agricultural loans divided by gross loans
NONPERFORM	nonperforming loans divided by gross loans
CHGOFF	net charge-offs divided by the loan loss reserve
MTGLOAN	total domestic real estate and home equity loans divided by gross loans
CAPRATIO	total risk-adjusted capital ratio
INTANG	intangible assets divided by total assets
SENSITIVE	(rate-sensitive assets – rate-sensitive liabilities)/total assets
SAVING	dichotomous variable coded 1 if the company is a savings institution (SIC codes 6035 and 6036), and 0 otherwise

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Table 1 Sample

Panel A: Sample selection procedure

Sample Screen	**N**
Number of inspection reports of US domiciled audit firms with fair value deficiencies 2008-2015	123
Bank and nonbank issuers clients of deficient audit firms reporting positive values of level 2 and level 3 fair value assets 2008-2015	24,242
Less: Nonbank issuers	21,223
Bank issuer-years of audit firms with fair value deficiencies 2008-2015	3,019
Less: Bank issuer-years without sufficient data for uncertainty analysis	(1,386)
Bank issuer-years of inspected audit firms with sufficient data for analysis	1,633
Less: Bank issuer-years of triennially inspected audit firms	(140)
Bank issuer-years of annually inspected audit firms with sufficient data for uncertainty analysis	1,493

Panel B: Frequency of fair value deficient inspection reports for annually inspected audit firms

Year inspection ended	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
PWC	0	2	1	1	1	1	1	1
E&Y	0	0	1	1	1	1	1	1
D&T	1	1	0	1	1	1	0	1
KPMG	1	2	0	2	0	2	0	1
Grant Thornton	0	2	0	1	1	1	1	1
BDO USA	0	0	1	1	0	1	1	0
Malone Bailey	0	0	1	0	0	1	1	0
Crowe Horwath	0	0	0	1	1	0	1	0
McGladreyPullen/RSM	0	1	0	1	0	1	1	0
Total	3	8	4	9	5	9	7	5

Table 2 Descriptive statistics and univariate tests

Panel A: Descriptive statistics for full sample and Big4/non-Big4

	Mean	Q1	Median	Q3	Standard Deviation
Full Sample (All Annually Inspected Audit Firms)					
BETA_ADJ	0.111	0.057	0.111	0.155	0.079
FVA1	0.008	0	0.001	0.004	0.022
FVA2	0.182	0.110	0.161	0.233	0.117
FVA3	0.004	0	0.000	0.003	0.010
NFVA	0.805	0.881	0.898	0.913	0.042
LEV	0.896	0.757	0.829	0.882	0.127
FVDEF	0.226	0	0.190	0.375	0.215
Big 4 Audit Firms Only					
BETA_ADJ	0.126	0.084	0.125	0.163	0.076
FVA1	0.010	0.000	0.001	0.006	0.025
FVA2	0.185	0.110	0.156	0.229	0.129
FVA3	0.005	0	0.001	0.005	0.009
NFVA	0.800	0.755	0.833	0.881	0.141
LEV	0.892	0.879	0.895	0.909	0.047
FVDEF	0.279	0.100	0.227	0.444	0.221
Annually Inspected Non-Big 4 Audit Firms Only					
BETA_ADJ	0.083	0.024	0.076	0.130	0.078
FVA1	0.004	0	0	0.002	0.014
FVA2	0.179	0.112	0.171	0.238	0.093
FVA3	0.003	0	0	0.001	0.011
NFVA	0.814	0.758	0.824	0.882	0.095
LEV	0.903	0.886	0.903	0.919	0.029
FVDEF	0.133	0	0	0.318	0.168

*, **, *** indicates significance at the 0.10, 0.05 and 0.01 level, respectively. *BETA_ADJ* = equity beta as assessed in the 30 days after the release of annual financial statements, multiplied by the ratio of equity to total assets. *FVA1, FVA2, FVA3, FVA23* = fair value of assets designated at levels 1, 2, 3 and 2 and 3, respectively, scaled by total assets. *NFVA* = other assets not measured at fair value scaled by total assets. *LEV* = total liabilities scaled by total assets. *FVDEF* = the number of issuers with fair value deficiencies in a PCAOB inspection report divided by the total number of issuers listed in a PCAOB inspection report.

Panel B: Differences of means and medians between Big 4 and annually-audited non-Big 4

Variables	Difference in Means (Big 4 – non-Big 4) *T-statistics in parenthesis*	Difference in Medians (Big 4 – non-Big 4) *Z-statistics in parenthesis*
BETA_ADJ	0.043***	0.049***
	(10.47)	(11.27)
FVA1	0.006***	0.001***
	(5.43)	(10.79)
FVA2	0.006	-0.015
	(0.90)	(1.35)
FVA3	0.002***	0.001***
	(3.41)	(-8.19)
NFVA	-0.015**	0.009
	(2.05)	(0.11)
LEV	-0.011***	-0.008***
	(4.63)	(6.22)
FVDEF	0.146***	0.227***
	(13.39)	(13.75)

Table 3 Correlation matrix for variables of interest (pearson coefficients above the diagonal; spearmen below the diagonal)

	BETA_ADJ	***FVA1***	***FVA2***	***FVA3***	***NFVA***	***LEV***	***FVDEF***	***LnAFEES***
BETA_ADJ		0.030	0.004	0.079***	-0.014	-0.513***	0.073***	0.390
FVA1	0.215***		0.238***	0.198***	-0.408***	0.028	-0.005	0.267***
FVA2	-0.001	0.097***		0.254***	-0.980***	0.078***	0.099***	0.228***
FVA3	0.186***	0.165***	0.089***		-0.341***	0.035	-0.001	0.399***
NFVA	-0.013	-0.203***	-0.976***	-0.136***		-0.078***	-0.092***	-0.285***
LEV	-0.471***	-0.071***	0.054**	-0.024	-0.054**		-0.057**	-0.105***
FVDEF	0.108***	0.076***	0.094***	0.054***	-0.092***	-0.110***		0.095***
LnAFEES	0.510***	0.379***	0.003	0.395***	-0.042*	-0.333***	0.510***	

*, **, *** indicates significance at the 0.10, 0.05 and 0.01 level, respectively. *BETA_ADJ* = equity beta as assessed in the 30 days after the release of annual financial statements, multiplied by the ratio of equity to total assets. *FVA1, FVA2, FVA3, FVA23* = fair value of assets designated at levels 1, 2, 3 and 2 and 3, respectively, scaled by total assets. *NFVA* = other assets not measured at fair value scaled by total assets. *LEV* = total liabilities scaled by total assets. *DISPERSION* = standard deviation of quarterly earnings forecast. *FVA* = total fair value assets scaled by total assets. *FV2* = proportion of level 2 assets of total fair value assets. *FV3* = proportion of level 3 assets of total fair value assets. *LnAfees* = logged audit fees in the year following the deficient inspection

Table 4 Information uncertainty of FV assets post-inspection

Panel A: Full Sample partitioned on inclusion of fixed effects and FVA2/FVA3 treatment

$$BETA\_ADJ_{it} = (\alpha_1 FVA1_{it} + \alpha_2 FVA2_{it} + \alpha_3 FVA3_{it}) + FVDEF + FVDEF \times (\alpha_{1a} FVA1_{it} + \alpha_{2a} FVA2_{it} + \alpha_{3a} FVA3_{it}) + \alpha_4 NFVA_{it} + \alpha_5 LEV_{it} + \epsilon$$

Variable	Predicted Sign H1	(1) Full Sample (FV2 and FV3)	(2) Full Sample (FV2 and FV3)	(3) Full Sample (FV23)	(4) Full Sample (FV23)
FVA1		0.950***	-0.253	0.980***	-0.207
		(5.50)	(-1.15)	(5.60)	(-0.91)
FVA2		1.068***	0.024		
		(11.24)	(0.13)		
FVA3		1.346***	0.184		
		(3.66)	(0.57)		
FVA23				1.081***	0.063
				(11.36)	(0.34)
FVDEF		0.069***	0.052***	0.068***	0.051***
		(3.45)	(2.75)	(3.24)	(2.71)
FVA1 FVDEF*		0.788**	0.736**	0.794**	0.754**
		(2.16)	(2.12)	(2.10)	(2.16)
FVA2 FVDEF*	-	-0.263***	-0.271***		
		(-3.33)	(-3.49)		
FVA3 FVDEF*	-	0.820	0.807		
		(1.25)	(1.27)		
FVA23 FVDEF*	-			-0.234***	-0.241***
				(-3.24)	(-3.43)
NFVA		1.001***	-0.065	1.007***	-0.028
		(11.64)	(-0.32)	(11.61)	(-0.14)
LEV		-0.955***	-0.917***	-0.960***	-0.919***
		(-10.11)	(-9.92)	(-10.09)	(-9.90)
Untabulated Fixed Effects		**Year**	**Year and Audit firm**	**Year**	**Year and Audit firm**
Clustered Standard Error		**By Bank**	**By Bank**	**By Bank**	**By Bank**
Observations		1,493	1,493	1,493	1,493
Adjusted R-squared		79.11%	80.92%	78.99%	80.84%

*, **, *** indicates significance at the 0.10, 0.05 and 0.01 level, respectively. T-statistics in parentheses. All tests two-tailed unless hypothesized. *BETA_ADJ* = equity beta as assessed in the 30 days after the release of annual financial statements, multiplied by the ratio of equity to total assets. *FVA1, FVA2, FVA3, FVA23* = fair value of assets designated at levels 1, 2, 3 and 2 and 3, respectively, scaled by total assets. *NFVA* = other assets not measured at fair value scaled by total assets. *LEV* = total liabilities scaled by total assets. *FVDEF* = ratio of fair value deficient issuers in an inspection report to the total deficient issuers in an inspection report.

Table 4 Information uncertainty of FV assets post-inspection (cont.)

Panel B: High/low risk exposure to complex estimates partition with Fixed Effects

$$BETA\_ADJ_{it} = (\alpha_1 FVA1_{it} + \alpha_2 FVA2_{it} + \alpha_3 FVA3_{it}) + FVDEF + FVDEF \times (\alpha_{1a} FVA1_{it} + \alpha_{2a} FVA2_{it} + \alpha_{3a} FVA3_{it}) + \alpha_4 NFVA_{it} + \alpha_5 LEV_{it} + \epsilon$$

Variable	Predicted Sign	(1) High Risk (FV2 and FV3)	(2) Low Risk (FV2 and FV3)	(3) High Risk (FV23)	(4) Low Risk (FV23)
FVA1		-0.155	0.120	-0.094	0.146
		(-0.45)	(0.22)	(-0.27)	(0.26)
FVA2		0.029	0.573		
		(0.10)	(1.18)		
FVA3		0.333	0.886		
		(0.82)	(1.46)		
FVA23				0.073	0.610
				(0.25)	(1.26)
FVDEF		0.101***	0.016	0.096	0.023
		(3.79)	(0.37)	(3.61)	(0.53)
*FVA1*FVDEF*		0.667	1.252**	0.661	1.188**
		(1.53)	(2.07)	(1.48)	(1.98)
*FVA2*FVDEF*	-	-0.377***	-0.128		
		(-4.25)	(-0.44)		
*FVA3*FVDEF*	-	0.500	1.945		
		(0.77)	(1.28)		
*FVA23*FVDEF*	-			-0.338***	-0.140
				(-4.19)	(-0.48)
NFVA		-0.045	0.228	-0.009	0.255
		(-0.14)	(0.51)	(-0.03)	(0.57)
LEV		-1.170***	-0.901***	-1.183***	-0.899***
		(-6.87)	(-10.34)	(-6.99)	(-10.27)
Untabulated Fixed Effects		**Year and Audit firm**	**Year and Audit firm**	**Year and Audit firm**	**Year and Audit firm**
Clustered Standard Errors		**By Bank**	**By Bank**	**By Bank**	**By Bank**
Observations		735	768	735	768
Adjusted R-squared		81.44%	82.25%	81.26%	82.14%

*, **, *** indicates significance at the 0.10, 0.05 and 0.01 level, respectively. T-statistics in parentheses. All tests two-tailed unless hypothesized. *BETA_ADJ* = equity beta as assessed in the 30 days after the release of annual financial statements, multiplied by the ratio of equity to total assets. *FVA1, FVA2, FVA3, FVA23* = fair value of assets designated at levels 1, 2, 3 and 2 and 3, respectively, scaled by total assets. *NFVA* = other assets not measured at fair value scaled by total assets. *LEV* = total liabilities scaled by total assets. *FVDEF* = ratio of fair value deficient issuers in an inspection report to the total deficient issuers in an inspection report.

Table 5 Net transfers into level 3 assets and PCAOB inspections

$$LN\_TRANSFERS_{it} = \alpha_1 FVDEF + \alpha_2 NFVA_{it-1} + \alpha_3 FVA123_{it-1} + \alpha_4 CHG\_ASSET_{it} + \alpha_5 TRANSFERS\_LVL3_{it-1} + \alpha_6 MTB_{it} + \alpha_7 TCAP_{it-1} + \alpha_8 SIFI + \alpha_9 BIG4_{it}$$

Variable	Predicted Sign	DV = Transfers as defined by Kohlbeck et al. 2017 Tobit Model (left censored)
INTERCEPT		-13.806***
		(-4.26)
FVDEF	-	-2.532*
		(-1.54)
NFVA		0.993**
		(2.26)
FVA123		0.507
		(1.60)
CHG_ASSET		2.559
		(1.39)
LN_TRANSFERS$_{t-1}$		0.389**
		(2.40)
MTB		-0.350
		(-0.48)
TCAP$_{t-1}$		-0.083
		(-0.93)
SIFI		-1.436
		(-1.22)
BIG4		-1.274*
		(-1.65)
Observations		884
Fixed Effects		Year

*, **, *** indicates significance at the 0.10, 0.05 and 0.01 level, respectively. T-statistics in parentheses. All tests two-tailed unless hypothesized. *LN_TRANSFERS* = the natural log of net transfers if positive and zero otherwise. *LN_NFVA* = the natural log of non-fair value assets. *LN_FVA123* = the natural log of fair value assets designated as level 1, 2 and 3. *CHG_ASSET* = percent growth in assets over the year. *MTB* = the market to book ratio of the issuer client at the beginning of the year. *TCAP* = the total risk-based capital ratio of the bank issuer client at the beginning of the year. *SIFI* = an indicator variable set to 1 if the bank qualifies as a "significantly important financial institution (assets > $50 billion) and zero otherwise. *BIG4* = an indicator variable set to 1 if the audit firm retained by the issuer client is a member of the Big 4 and zero otherwise.

Table 6 Audit fee models

$$LnAFEES_{it+1} = (\alpha_1 FVA1_{it} + \alpha_2 FVA2_{it} + \alpha_3 FVA3_{it}) + \alpha_4 FVDEF + FVDEF \times (\alpha_{1a} FVA1_{it} + \alpha_{2a} FVA2_{it} + \alpha_{3a} FVA3_{it}) + \alpha_5 LnASSET_{it} + \alpha_6 BIGN_{it} + \alpha_7 LOSS_{it} + \alpha_8 STDRET_{it} + \alpha_9 TRANSACCT_{it} + \alpha_{10} SECURITIES_{it} + \alpha_{11} EFFICIENCY + \alpha_{12} COMMLOAN_{it} + \alpha_{13} NONPERFORM + \alpha_{14} CHGOFF_{it} + \alpha_{15} MTGLOAN_{it} + \alpha_{16} CAPRATIO_{it} + \alpha_{17} INTANG_{it} + \alpha_{18} SENSITIVE_{it} + \alpha_{18} SAVING_{it} + \epsilon$$

Variable	Predicted Sign	(1) Full Sample (FV2 and FV3)	(2) Full Sample (FV23)
INTERCEPT		3.593***	3.356***
		(7.17)	(6.61)
FVA1		-0.130	-0.001
		(-0.15)	(-0.00)
FVA2	+	0.966***	
		(3.66)	
FVA3	+	4.364	
		(1.55)	
FVA23	+		1.006***
			(4.11)
FVDEF		0.169	0.157
		(1.47)	(1.24)
*FVA1*FVDEF*		2.260	1.424
		(0.92)	(0.57)
*FVA2*FVDEF*	+	-0.684	
		(-1.46)	
*FVA3*FVDEF*	+	12.794**	
		(1.50)	
*FVA23*FVDEF*	+		-0.281
			(-0.47)
LnASSET		0.568***	0.584***
		(27.60)	(27.33)
BIG4		0.211**	0.197*
		(2.04)	(1.91)
LOSS		0.032	0.035
		(0.54)	(0.59)
STDRET		0.216	0.245
		(0.65)	(0.71)
TRANSACCT		0.043	0.039
		(0.21)	(0.19)
SECURITIES		0.986***	1.033***
		(3.70)	(4.01)
EFFICIENCY		-0.024	-0.024
		(-0.08)	(-0.09)
COMMLOAN		-0.649***	-0.697*
		(-1.87)	(-1.93)
NONPERFORM		3.297***	3.345***
		(2.87)	(2.96)
CHGOFF		0.089*	0.090**
		(1.91)	(1.97)
MTGLOAN		-0.471**	-0.508**
		(-1.99)	(-2.03)
CAPRATIO		0.015***	0.016***
		(2.84)	(3.03)

INTANG	1.922	1.645
	(1.58)	(1.36)
SENSITIVE	0.182	0.200
	(1.22)	(1.36)
SAVING	0.041	0.041
	(0.37)	(0.36)
Untabulated Fixed Effects	**Year and Audit firm**	**Year and Audit firm**
Clustered Standard Errors	**By Bank**	**By Bank**
Observations	1,336	1,336
Adjusted R-squared	86.69%	86.47%

*, **, *** indicates significance at the 0.10, 0.05 and 0.01 level, respectively. T-statistics in parentheses. All tests two-tailed unless hypothesized. *FVA1, FVA2, FVA3, FVA23* = fair value of assets designated at levels 1, 2, 3 and 2 and 3, respectively, scaled by total assets. *LnAfees* = logged audit fees in the year following the deficient inspection. *INSPECT* = 1 if fair value deficient inspection was issued prior to end of fiscal year and 0 otherwise. *LnASSET* = natural log of assets. *BIG4* = 1 if the issuer employs a big-4 auditor and 0 otherwise. *LOSS* = 1 if net income is less than zero and 0 otherwise. *STDRET* = issuer-specific standard deviation of 12 monthly returns ending at the fiscal year-end. *TRANSACCT* = total transaction accounts divided by total deposits. *SECURITIES* = [1-(total securities/total assets)]. *EFFICIENCY* = total operating expenses divided by total revenue. *COMMLOAN* = the sum of commercial and agricultural loans divided by gross loans. *NONPERFORM* = nonperforming loans divided by gross loans. *CHGOFF* = net charge-offs divided by the loan loss reserve. *MTGLOAN* = total domestic real estate and home equity loans divided by gross loans. *CAPRATIO* = total risk-adjusted capital ratio. *INTANG* = intangible assets divided by total assets. *SENSITIVE* = (rate-sensitive assets – rate-sensitive liabilities)/total assets. *SAVINGS* = dichotomous variable coded 1 if the company is a savings institution (SIC codes 6035 and 6036), and 0 otherwise.

Table 7 Fair value footnote disclosure variables

Panel A: Descriptive statistics of fair value footnote variables

	Mean	Q1	Median	Q3	Standard Deviation
LN_WORD	7.809	7.465	7.820	8.167	0.577
ASSET_CAT	7.580	5	7	9	4.911
LIAB_CAT	1.709	0	1	2	2.155

WORDCOUNT = log of the number of words contained in the fair value footnote of the annual report. *ASSET_CAT* = number of categories related to fair value assets measured on a recurring basis disclosed in the fair value footnote of the annual report. *LIAB_CAT* = number of categories related to fair value liabilities on a recurring basis disclosed in the fair value footnote of the annual report. *LN_TRANSFERS* = log of net transfers into level 3 if positive, otherwise 0. *TRANSFERS* = transfers in (out) of level 3 scaled by total fair value assets designated as level 1, level 2 and level 3.

Panel B: Differences in means pre-/post-inspection for fair value footnote variables

Variables	*INSPECT* = 1	*INSPECT* = 0	Difference in means
LN_WORD	7.824	7.562	-8.07***
ASSET_CAT	7.738	5.522	-7.84***
LIAB_CAT	1.556	1.122	-3.60***

Panel C: Differences in means High/Low *FVDEF* (above/below *FVDEF* median)

Variables	*FVDEF* > median	*FVDEF* < median	Difference in means
LN_WORD	7.829	7.680	-5.15***
ASSET_CAT	7.759	6.529	-4.83***
LIAB_CAT	1.536	1.342	-1.80*

Table 8 SEC Comment letter analysis

$$BETA\_ADJ_{it} = (\alpha_1 FVA1_{it} + \alpha_2 FVA2_{it} + \alpha_3 FVA3_{it}) + FVDEF + FVDEF \times (\alpha_{1a} FVA1_{it} + \alpha_{2a} FVA2_{it} + \alpha_{3a} FVA3_{it}) + \alpha_4 NFVA_{it} + \alpha_5 LEV_{it} + \epsilon$$

Variable	Predicted Sign H1	(1) No Fair Value Comment Letter (FV2 and FV3)	(2) Fair Value Comment Letter (FV2 and FV3)	(3) No Fair Value Comment Letter (FV23)	(4) Fair Value Comment Letter (FV23)
FVA1		0.012	-0.302	0.065	-0.305
		(0.05)	(-0.90)	(0.30)	(-0.96)
FVA2		0.292*	-0.330		
		(1.72)	(-1.15)		
FVA3		0.465	-0.291		
		(1.50)	(-0.55)		
FVA23				0.336**	-0.331
				(2.02)	(-1.22)
FVDEF		0.046*	0.071**	0.044*	0.072**
		(1.95)	(2.25)	(1.86)	(2.28)
*FVA1*FVDEF*		0.703	0.322	0.726	0.323
		(1.61)	(0.65)	(1.65)	(0.66)
*FVA2*FVDEF*	-	-0.269***	-0.240***		
		(-2.60)	(-2.01)		
*FVA3*FVDEF*	-	1.690	-0.599		
		(2.33)	(-0.56)		
*FVA23*FVDEF*	-			-0.228***	-0.253***
				(-2.30)	(-2.51)
NFVA		0.213	-0.421	0.254	-0.424
		(1.19)	(-1.41)	(1.43)	(-1.49)
LEV		-0.882***	-1.340***	-0.883***	-1.336***
		(-10.00)	(-7.86)	(-9.99)	(-7.92)
Untabulated Fixed Effects		**Year and Audit firm**	**Year and Audit firm**	**Year and Audit firm**	**Year and Audit firm**
Clustered Standard Errors		**By Bank**	**By Bank**	**By Bank**	**By Bank**
Observations		1,135	358	1,135	358
Adjusted R-squared		78.98%	88.41%	78.81%	88.41%

*, **, *** indicates significance at the 0.10, 0.05 and 0.01 level, respectively. T-statistics in parentheses. All tests two-tailed unless hypothesized. *BETA_ADJ* = equity beta as assessed in the 30 days after the release of annual financial statements, multiplied by the ratio of equity to total assets. *FVA1*, *FVA2*, *FVA3*, *FVA23* = fair value of assets designated at levels 1, 2, 3 and 2 and 3, respectively, scaled by total assets. *NFVA* = other assets not measured at fair value scaled by total assets. *LEV* = total liabilities scaled by total assets. *FVDEF* = ratio of fair value deficient issuers in an inspection report to the total deficient issuers in an inspection report.

Table 9

Panel A: Quarterly test of information uncertainty and fair value assets pre-/post-inspection report issue

$$BETA\_ADJ_{it} = \alpha_1 FVA1_{it} + \alpha_2 FVA2_{it} + \alpha_3 FVA3_{it} + \alpha_4 NFVA_{it} + \alpha_5 LEV_{it} + \epsilon$$

Variable	Test for Coefficient Differences (t-statistic)	(1) Pre-Issue Quarter (FV2 and FV3)	(2) Post-Issue Quarter (FV2 and FV3)
FVA1	1.354	0.586*	1.117***
		(1.77)	(5.33)
FVA2	1.746**	0.496***	0.956***
		(2.38)	(5.85)
FVA3	0.102	1.392***	1.454***
		(3.01)	(3.69)
NFVA		0.567***	0.948***
		(2.83)	(6.11)
LEV		-0.497**	-0.823***
		(-2.21)	(-5.03)
Untabulated Fixed Effects		**Quarter**	**Quarter**
Clustered Standard Errors		**By Bank**	**By Bank**
Observations		579	563
Adjusted R-squared		43.38%	57.48%

*, **, *** indicates significance at the 0.10, 0.05 and 0.01 level, respectively. T-statistics in parentheses. All tests two-tailed unless hypothesized. *BETA_ADJ* = equity beta as assessed in the 30 days after the release of annual financial statements, multiplied by the ratio of equity to total assets. *FVA1, FVA2, FVA3, FVA23* = fair value of assets designated at levels 1, 2, 3 and 2 and 3, respectively, scaled by total assets. *NFVA* = other assets not measured at fair value scaled by total assets. *LEV* = total liabilities scaled by total assets.

Panel B: Changes in fair value holdings pre-/post-inspection

Variables	Mean			Median		
	INSPECT = 1	INSPECT = 0	Difference	INSPECT = 1	INSPECT = 0	Difference
Δ*BETA_ADJ*	-0.0048	-0.0162	0.0114**	-0.0005	-0.0098	0.0093***
Δ*FVA1*	0.0003	-0.0007	0.00107	0	0	0
Δ*FVA2*	-0.0045	0.0065	-0.0109***	-0.0041	0.0069	-0.0110
Δ*FVA3*	-0.0004	0.0001	0.0006	0	0	0
Δ*NFVA*	0.0045	-0.0060	0.0105**	0.0041	-0.0070	0.0111
Δ*LEV*	-0.0020	-0.0014	0.0006	-0.0010	-0.0013	0.0003***

Table 10 Information Uncertainty for Fair Value Assets Post-Inspection, Alternate Dependent Variables Specification

$$CORR\_ADJ_{it} \text{ or } STD\_ADJ_{it} = (\alpha_1 FVA1_{it} + \alpha_2 FVA2_{it} + \alpha_3 FVA3_{it}) + INSPECT + INSPECT \times (\alpha_{1a} FVA1_{it} + \alpha_{2a} FVA2_{it} + \alpha_{3a} FVA3_{it}) + \alpha_4 NFVA_{it} + \alpha_5 LEV_{it} + \epsilon$$

Variable	(1) *DV= CORR_ADJ* (FV2 and FV3)	(2) *DV= STD_ADJ* (FV2 and FV3)	(3) *DV=CORR_ADJ* (FV23)	(4) *DV=STD_ADJ* (FV23)
FVA1	-0.049	0.173	-0.048	0.273
	(-0.88)	(0.36)		(0.54)
FVA2	0.006	0.110		
	(0.11)	(0.27)		
FVA3	-0.091	1.423**		
	(-0.75)	(2.25)		
FVA23			0.007	0.200
				(0.47)
FVDEF	0.011	-0.030	0.009	-0.022
	(1.49)	(-0.73)	(1.35)	(-0.54)
*FVA1*FVDEF*	0.335**	-0.264	0.116**	-0.426
	(2.83)	(-0.33)		(-0.55)
*FVA2*FVDEF*	-0.089***	0.045		
	(2.83)	(0.30)		
*FVA3*FVDEF*	0.736***	-5.153***		
	(2.80)	(-3.79)		
*FVA23*FVDEF*			-0.067**	-0.098
			(-2.31)	(-0.70)
NFVA	-0.024	0.271	-0.019	0.256
			(-0.34)	(0.56)
LEV	-0.270***	-4.467***	-0.272***	-4.450***
			(-3.84)	(-6.96)
Untabulated Fixed Effects	**Year and Audit firm**	**Year and Audit firm**	**Year and Audit firm**	**Year and Audit firm**
Clustered Standard Errors	**By Bank**	**By Bank**	**By Bank**	**By Bank**
Observations	1,493	1,493	1,493	1,493
Adjusted R-squared	83.68%	84.17%	83.60%	84.16%

*, **, *** indicates significance at the 0.10, 0.05 and 0.01 level, respectively. T-statistics in parentheses. All tests two-tailed unless hypothesized. *CORR_ADJ* = correlation between daily bank-issuer returns and daily value-weighted market return in the 30 days after the release of annual financial statements, multiplied by the ratio of equity to total assets. *STD_ADJ* = standard deviation of daily bank-issuer returns scaled by the standard deviation of daily value-weighted market returns in the 30 days after the release of annual financial statements, multiplied by the ratio of equity to total assets. *FVA1, FVA2, FVA3, FVA23* = fair value of assets designated at levels 1, 2, 3 and 2 and 3, respectively, scaled by total assets. *NFVA* = other assets not measured at fair value scaled by total assets. *LEV* = total liabilities scaled by total assets. *INSPECT* = 1 if fair value deficient inspection was issued prior to end of fiscal year and 0 otherwise.

Table 11 Alternate specifications of inspection event variable

$$BETA\_ADJ_{it} = (\alpha_1 FVA1_{it} + \alpha_2 FVA2_{it} + \alpha_3 FVA3_{it}) + INSPECTVAR + INSPECTVAR \times (\alpha_{1a} FVA1_{it} + \alpha_{2a} FVA2_{it} + \alpha_{3a} FVA3_{it}) + \alpha_4 NFVA_{it} + \alpha_5 LEV_{it} + \epsilon$$

Variable	Predicted Sign H1	(1) INSPECTVAR = INSPECT	(2) INSPECTVAR = INSPECTNUM	(3) INSPECTVAR = FVNUM
FVA1		-0.29	-0.084	-0.205
		(-1.17)	(-0.34)	(-0.92)
FVA23		0.090	0.042	0.062
		(0.49)	(0.23)	(0.34)
INSPECTVAR		0.012**	0.007	0.039**
		(2.03)	(1.50	(2.43)
FVA1 FVDEF*		0.339**	0.591	0.198**
		(2.39)	(0.53)	(1.59)
FVA23 FVDEF*	-	-0.079***	-0.039*	-0.159***
		(-3.35)	(-1.93)	(-2.58)
NFVA		-0.007***	-0.023	-0.018***
		(-0.03)	(-0.11)	(-0.09)
LEV		-0.918***	-0.917***	-0.917***
		(-9.86)	(-9.83)	(-9.86)
Untabulated Fixed Effects		**Year and Audit firm**	**Year and Audit firm**	**Year and Audit firm**
Clustered Standard Error		**By Bank**	**By Bank**	**By Bank**
Observations		1,493	1,493	1,493
Adjusted R-squared		80.75%	80.66%	80.77%

*, **, *** indicates significance at the 0.10, 0.05 and 0.01 level, respectively. T-statistics in parentheses. All tests two-tailed unless hypothesized. *INPSECT* = 1 if an auditor received a fair value deficient inspection report during the fiscal year and 0 otherwise. *INSPECTNUM* = total number of fair value deficient inspections received by an auditor during the sample period to date. *FVNUM* = number of fair value deficiencies in an inspection report divided by the total number of deficiencies in an inspection report. *BETA_ADJ* = equity beta as assessed in the 30 days after the release of annual financial statements, multiplied by the ratio of equity to total assets. *FVA1, FVA2, FVA3, FVA23* = fair value of assets designated at levels 1, 2, 3 and 2 and 3, respectively, scaled by total assets. *NFVA* = other assets not measured at fair value scaled by total assets. *LEV* = total liabilities scaled by total assets. *FVDEF* = ratio of fair value deficient issuers in an inspection report to the total deficient issuers in an inspection report.